

CLAIM AMENDMENTS

1 (Currently Amended)

5 A pool cover system for operating a buoyant cover and where the cover is controlled in at least closing movements of said cover relative to a swimming pool, said pool cover system comprising:

10 a) a rotatable cover drum for winding a buoyant cover comprised of at least one buoyant panel onto said drum and allowing the force of gravity or buoyancy acting upon said pool cover to cause an unwinding of the cover from the drum to a closed position so that the cover may extend across and cover the swimming pool, ~~said cover moving across said swimming pool with at least the force of gravity or buoyancy operating on said cover;~~

15 b) a fluid motor for causing driving movement of the cover drum allowing the pool cover to move across a swimming pool to an open position with winding of the cover onto the cover drum; and

20 c) a travel limiting means for controlling the limits of movement of the cover and stopping movement of the cover through the action of a fluid pressure differential which is generated when the cover has reached a closed position to
25 preclude further movement of the cover at the

closed position, and electrical means operable
in response to said fluid pressure differential
to initiate an electrical response and stop
rotation of said drum when the cover reaches
the closed position.

2 (Previously Presented)

The pool cover system of Claim 1 further characterized that
said fluid motor is operated by an electrical power pack remote from
the hydraulic motor and from the swimming pool and said electrical
response occurs in association with said electrical power pack.

3 (Previously Presented)

The pool cover system of Claim 1 further characterized in that
said cover drum is located in a position where it is submerged in
water and buoyant forces act upon the cover wound upon said drum to
cause an unwinding thereof such that a positive driving force to
move the cover to the closed position would not necessarily be
required, and said movement control means controls movement
resulting from the tendency of the cover to unwind from said cover
drum.

4 (Previously Presented)

The pool cover system of Claim 3 further characterized in that said fluid motor provides a positive driving action for moving the cover to the opened position when winding the pool cover about the drum, but operating in conjunction with a braking means to provide a braking action when the cover is unwinding from the drum to thereby restrain tendency of the cover to unwind from the drum.

5-8 (Cancelled)

9 (Previously Presented)

The pool cover system of Claim 3 further characterized in that said travel limiting means comprises a mechanically actuated limit switch.

10 (Currently Amended)

The pool cover system of Claim ~~77~~ 89 further characterized in that the movement control means comprises a worm gear drive.

11 (Previously Presented)

The pool cover system of Claim 3 further characterized in that
said fluid motor is a hydraulic motor, said pool cover system
comprises a hydraulic pump, and said travel limiting means comprises
5 a pressure sensitive device responsive to said pressure
differential.

12 (Cancelled)

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13 (Currently Amended)

A pool cover system for operating a buoyant swimming pool cover comprised of at least one buoyant panel and for moving same across a swimming pool to a closed position where the cover extends over the swimming pool and back to an opened position, said automatic pool cover system comprising:

- a) a cover drum upon which the buoyant swimming pool cover is wound thereon to allow the swimming pool to be in an opened condition and which allows for unwinding from the drum to cover the swimming pool;
- b) a fluid drive motor operatively connected to said drum for rotating same and causing a winding of the pool cover onto the drum when opening the swimming pool;
- c) an electrically operated power pack in a position remote from said pool cover and said fluid drive motor to provide a fluid driving force for operating said fluid drive motor;
- d) fluid line means carrying fluid supplied to the fluid drive motor and connected between said power pack and said fluid drive motor, such that said pool cover system can operate with said cover drum being subaqueously located or ~~an elevated cover drum~~, thereby electrically

insulating the power pack from the fluid drive motor and thereby eliminating any electrical hazard at or in proximity to the swimming pool; and

- 5 e) pressure responsive means operable in response to pressure of fluid in the fluid line means such that the system provides control over a limit of movement of the cover.

10 14 (Currently Amended)

The pool cover system of Claim 13 further characterized in that said fluid motor is a hydraulic motor and said fluid ~~lines carry~~ line means carries hydraulic fluid, and said power pack includes a hydraulic pump in proximity to said electric motor for operation by
15 said electric motor.

15 15 (Previously Presented)

The pool cover system of Claim 13 further characterized in that said drum is mounted on a drum shaft powered for rotation by said
20 fluid drive motor in at least the wind-up direction to wind the pool cover onto the drum, and a brake means is operable with respect to said shaft when said pool cover is being unwound from said drum allowing the cover to move to the closed position.

16 (Currently Amended)

The pool cover system of Claim ~~13~~ 15 further characterized in that said pressure responsive means comprises travel limiting means which is operatively connected to said drum shaft and provides control for the end of travel positions of the pool cover in both the opened and the closed positions to thereby preclude an overwinding or unwinding of the cover at the closed or opened positions.

17 (Currently Amended)

The pool cover system of Claim 16 further characterized in that said travel limiting means has a traveler rotatable shaft and a traveler shiftable on said shaft in response to and proportional to rotation of said drum, such that the traveler moves for a distance proportional to the distance of movement of the cover.

18 (Previously Presented)

The pool cover system of Claim 17 further characterized in that said drum is mounted for rotation on a drum shaft, and means couples the traveler shaft of said travel limiting device to the drum shaft, such that when the traveler reaches an end position, it will result in an action which causes the sending of a signal to an electrical circuit arrangement and which circuit arrangement will operate to stop movement of the drum shaft.

19 (Previously Presented - Allowed)

A pool cover system for moving a swimming pool cover comprised of at least one buoyant panel to a closed position where the cover extends over a swimming pool and back from the closed position to an open position where the cover is wound upon a cover drum, said pool cover system comprising:

- a) a drum for winding the cover onto the drum when the cover is being moved to the opened position allowing access to the swimming pool;
- b) fluid operated motive means for causing rotation of the drum to wind the cover onto the drum; and
- c) one-way brake means for providing a braking action which controls the speed of movement of the cover from the fully opened position where the cover is wound upon the drum to the closed position when the cover is moving across the swimming pool, and which brake means operates in a first mode to provide no braking action and no braking force is applied to the drum or to the pool cover when the motive means is rotating the cover drum to wind the cover on the drum bringing the cover to the opened position, said brake means also being operable in a second mode to provide a positive braking

action to control and limit the rate of
movement of the cover unwinding from the drum
when the cover is moving to the closed position
and which would otherwise move uncontrolled
5 toward the closed position as a result of
buoyant forces or the force of gravity acting
upon the pool cover, such that any braking
force is applied in one direction only and only
when the cover is moving from the opened
10 position to the closed position and no braking
force is applied when the cover is moving from
the closed position to the opened position.

20-21 (Cancelled)

22 (Previously Presented - Allowed)

The pool cover system of Claim 19 further characterized in that
said brake means comprises a drive ratio brake operating in
conjunction with the travel limiting device.

23 (Cancelled)

24 (Previously Presented - Allowed)

The pool cover system of Claim 19 further characterized in that the pool cover system comprises a rotary shaft travel limiter with a mechanically engageable traveling element.

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25 (Cancelled)

26 (Previously Presented - Allowed)

10 The pool cover system of Claim 19 further characterized in that said motive means comprises a hydraulic motor which is coupled to the cover drum for rotating same to wind the cover onto the drum, and the pool cover system comprises an electrically operated power pack at a remote site for supplying hydraulic pressure to operate the hydraulic motor, and a pressure relief valve located at the
15 remote power pack and operating in conjunction with the hydraulic motor to enable a bypassing of pressure to the hydraulic motor to provide for a braking action.

27 (Previously Presented - Allowed)

In an automatic cover system providing for winding a cover upon a drum from a fully closed position to a fully opened position and allowing for unwinding of the cover from the drum for movement to a fully closed position, an improvement comprising a travel limiting arrangement for controlling movement of the cover so that it does not excessively unwind from the drum when the cover reaches at least the closed position, said travel limiting arrangement having a travel limiter element moving a travel limiting distance between two travel limiting end positions on the travel limiting arrangement and where movement of the travel limiter element for a travel limiting distance is representative of a distance of movement of the cover between the opened and closed end positions of the cover, said traveler limiter element engaging with travel limiting end positions when the cover reaches its opened or closed end positions of movement, fluid control means associated with the travel limiter end positions and engageable by the travel limiter element and operable to provide a fluid pressure condition to control movement of the cover, thereby precluding any over-winding or over-unwinding of the cover at either of the fully opened position or fully closed position.

28-45 (Canceled)

46 (Previously Presented - Allowed)

A method of operating a swimming pool cover comprised of at least one buoyant panel which is capable of extending to a closed position over a swimming pool and to an opened position where it is wound upon a cover drum, said method comprising:

- a) providing a rotating power to said cover drum for rotating same at least in a wind-up direction to rotate the pool cover about the drum and which is powered for rotation only from a fluid driving source at or in proximity to said swimming pool;
- b) assembly in proportion to the movement of the drum;
- c) generating a fluid pressure condition when the traveler element reaches a first limit of travel at the closed position; and
- d) converting that pressure condition into an electrical action at a position remote to the swimming pool to stop rotating power to the cover drum, to thereby preclude over unwinding of the cover from the drum at such closed position.

47 (Previously Presented - Allowed)

The method of Claim 46 further characterized in that said method comprises providing fluid under pressure to a fluid motor located at or in proximity to said drum and which causes rotation of said drum, said fluid motor being operated by the fluid under pressure and which fluid is driven under pressure from an electrically operated power source at a remote location.

48 - 67 (Cancelled)

68 (Previously Presented)

The pool cover system of Claim 1 further characterized in that said fluid pressure differential is generated in a fluid pressure line associated with supplying fluid under pressure to said fluid motor and activates a fluid pressure switch in response thereto.

69 (Previously Presented)

The pool cover system of Claim 18 further characterized in that said travel limiting means comprises said fluid pressure switch.

70 (Previously Presented)

The pool cover system of Claim 69 further characterized in that said travel limiting means comprises a traveler element moving in response to rotation of the drum between a pair of traveler end positions.

71 (Currently Amended)

The pool cover system of Claim 13 further characterized in that said pool cover system comprises an electrical circuit arrangement operatively connected to the pressure responsive means and operable in response to ~~the~~ a pressure differential with respect to the fluid line means for controlling rotation of said cover drum and thereby controlling movement of said cover to preclude over-unwinding of said cover.

72 (Previously Presented)

The pool cover system of Claim 13 further characterized in that said drum is mounted on a drum shaft powered for rotation by said fluid drive motor in at least the wind-up direction to wind the pool cover onto the drum.

73 (Previously Presented)

The pool cover system of Claim 13 further characterized in that said pressure responsive means is operatively connected to a travel limiting device associated with said drum and provides control for the end of travel positions of the pool cover in both the opened and the closed positions to thereby preclude an overwinding or over-unwinding of the cover from the drum at the closed or opened positions.

74 (Currently Amended)

The pool cover system of Claim 73 further characterized in that said travel limiting device has a traveler rotatable shaft and ~~said~~ a travel limiter element is shiftable on said rotatable shaft in response to and proportional to rotation of said drum, such that the travel limiter element moves for a distance proportional to the distance of movement of the cover.

75 (Currently Amended)

The pool cover system of Claim 74 further characterized in that when the travel limiter element reaches an end position, it will result in an action which causes the sending of a signal to ~~the~~ an electrical circuit arrangement operatively connected to said pressure responsive means and which circuit arrangement will operate to stop movement of the drum.

76 (Previously Presented)

The improvement in the pool cover system of Claim 27 further characterized in that the travel limiting arrangement also comprises an electrical circuit arrangement operatively connected to the fluid control means for controlling rotation of the cover and stopping movement of the cover at a closed end position.

77 (Cancelled)

78 (Previously Presented)

The pool cover system of Claim 19 further characterized in that
5 said pool cover system comprises a travel limiting device for
limiting rotation of the drum in response to a fluid pressure
condition when the cover is unwinding from the drum and reaches the
closed position to thereby preclude an over-unwinding of the cover
from the drum thereat.

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A pool cover system for operating a buoyant cover and where the cover is controlled in at least closing movement relative to a swimming pool, said pool cover system comprising:

- a) a rotatable cover drum for winding a buoyant cover onto said drum thereby moving said cover to an opened position and allowing unwinding of the cover from the drum for movement to a closed position so that the cover may extend across and cover the swimming pool;
- b) a fluid drive motor for operating the cover drum and winding the cover onto the cover drum thereby causing an opening movement of the pool cover across the swimming pool to an open position;
- c) an electrically operated power assembly for causing operation of said fluid drive motor;
- d) means for detecting the presence of the cover when the cover moves to or near the closed position and causing generation of a pressure condition in response thereto; and
- e) an electrical ~~power~~ circuit arrangement for causing generation of a responsive electrical action in response to the generated pressure condition and causing the responsive electrical

action to abate operation of the fluid motor by
the power assembly.

80 (Previously Presented - Allowed)

5 The pool cover system of Claim 79 further characterized in that
said cover is controlled in both opening and closing movements to
prevent over-winding or over-unwinding at the opened and closed
positions.

10 81 (Previously Presented - Allowed)

The pool cover system of Claim 79 further characterized in that
the pressure condition is a change in fluid pressure generated in
a fluid line connected to said fluid drive motor.

15 82 (Currently Amended - Allowed)

The pool cover system of Claim 81 further characterized in that
the electrical circuit arrangement ~~is~~ comprises an electrical
latching circuit and the ~~response~~ responsive action to the pressure
condition is the generation of an electrical signal.

20 83 (Currently Amended - Allowed)

The pool cover system of Claim 79 further characterized in that
said electrical ~~power~~ circuit arrangement is associated with the
electrically operated power assembly and is remote from the fluid
25 drive motor and from the swimming pool.

84 (Currently Amended - Allowed)

The pool cover system of Claim 79 further characterized in that said cover drum is located in a position where it is submerged in water and buoyant or gravitational forces act upon the cover when wound upon said drum to cause an unwinding thereof, and a brake means forms part of said system to control movement of the cover to the closed position resulting from the tendency of the cover to unwind from said cover drum as a result of buoyant forces or gravitational forces.

85 (Previously Presented - Allowed)

The pool cover system of Claim 79 further characterized in that said cover drum is located in an elevated position where it is above the surface of the water in the swimming pool and gravitational forces tend to cause an unwinding of the cover from the drum to cause an unwinding thereof, and a brake means forms part of said system to control movement of the cover to the closed position resulting from the tendency of the cover to unwind from the drum as a result of gravitational forces.

86 (Previously Presented - Allowed)

The pool cover system of Claim 81 further comprising:

- a) a travel limiting housing;
- b) a travel limiter shaft arrangement extending
5 through said housing;
- c) a traveler element movable on said travel
limiter shaft arrangement and translating
movement therealong in response to relative
rotation between said transfer shaft
10 arrangement and said traveler element;
- d) a first fixed contact element in said travel
limiting device housing representing one end
position of travel of the pool cover and which
traveler element contacts the first fixed
15 contact element when the cover reaches a first
end position of travel across the swimming
pool; and
- e) a second fixed contact element in said housing
representing an opposite end position of travel
20 of the pool cover and which traveler element
contacts the second fixed contact element
substantially with the cover reaching a second
end position of travel across the swimming
pool.

87 (Previously Presented - Allowed)

The automatic pool cover system of Claim 86 further characterized in that said traveler element translates axially along said shaft through threaded engagement of said traveler element with said travel limiter shaft and which is keyed with respect to said housing to preclude rotation of said traveler element.

88 (Previously Presented - Allowed)

The travel limiting device of Claim 86 further characterized in that adjustment means is provided for adjusting the first and second end positions of the traveler element to coincide with the respective end positions of movement of the pool cover.

A pool cover system for operating a buoyant cover and where the cover is controlled in at least closing movements of said cover relative to a swimming pool, said pool cover system comprising:

- a) a rotatable cover drum for winding a buoyant cover comprised of at least one buoyant panel onto said drum and allowing the force of gravity or buoyance to cause an unwinding of the cover from the drum to a closed position so that the cover may extend across and cover the swimming pool;
- b) a fluid motor for causing driving movement of the cover drum allowing the pool cover to move across a swimming pool to an open position with winding of the cover onto the cover drum;
- c) a travel limiting means for controlling the limits of movement of the cover and stopping movement of the cover through the action of a fluid pressure differential which is generated when the cover has reached a closed position to preclude further movement of the cover at the closed position, and electrical means operable in response to said fluid pressure differential to initiate an electrical response and stop

rotation of said drum when the cover reaches
the closed position; and

- d) movement control means operatively associated
with said cover drum to control a rate of
movement of the cover from the cover drum
during extension of the cover over a swimming
pool.